An Automated Method for GeoDatabase Configuration Management

Tuesday, 2:00 p.m. - 3:00 p.m.
Tidewater Room
An Automated Method for GeoDatabase Configuration Management

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Background: APS - Current GIS Architecture Configuration

GIS - Feeder Workstation
3.0 GHz, 2 G RAM,
Dual 19” Flat Monitors

GIS - Citrix Workstation
> 400 MHz, 256 Meg,
Dual 21” Monitors

GIS CITRIX SERVER FARM
• Windows 2000, Citrix
• ESRI - ArcGIS 8.3
• Miner & Miner - ArcFM 8.3
• APS Custom Code

PRODUCTION EDIT
GISPROD - Production
SUN 2900 (dual core CPU)
4-1.2 GHz CPU - 16 G RAM
ArcSDE 8.3
8 x Oracle 9i

GISVIEW - Production
SUN V440
4-1.2 GHz CPU - 8 G RAM
ArcSDE 8.3
8 x Oracle 9i

PRODUCTION VIEW

DEVELOPMENT
GISDEV - Development
SUN 2900 (dual core CPU)
4-1.2 GHz CPU - 16 G RAM
ArcSDE 8.3
7 x Oracle 9i

GIS - Citrix Workstation
• Windows 2000
• ESRI - ArcGIS 8.3
• Miner & Miner - ArcFM 8.3
• APS Custom Code

FILER DISK STORAGE
Production
Oracle Data
View
Oracle Data
Development
Oracle Data

Veritas - VCS
Background: APS - Service Territory & Operational Boundaries

5 Operating Divisions

Metro: 2 Regions
- Metro
- Metro West

Metro Region =
75% of Customers,
15% of Service Territory
Background: APS - 1993 Entry into GIS

Decision to Implement GIS for Metro Region only:

Hand Drawn Maps
• Manual maps used for overhead Primary facility data
• Field collection of overhead Secondary & Svc data
• Manual maps used for underground facility data

Delivered Coverages were Loaded into ArcStorm

Implemented Edit Application on ArcInfo 7 & PowerTools.

Application & Data on Sun Solaris with Sybase

Converted 1000 square miles of land & facilities
Background : APS - 1999 GIS Architecture Projects

Database:
- ArcStorm to ArcSDE GeoDatabase conversion project for Metro
  - Define GeoDatabase Configuration
  - Convert from Sybase to Oracle
  - Migrate data from ArcStorm to Coverage to GeoDB

AND

Application:
- PowerTools to ArcGIS / ArcFM Application migration project
  - Define New & Custom Application Functionality
  - Migrate from Unix / Exceed to Windows Application

AND

State Conversion:
- State Wide Data Collection & Conversion Project
  - Incremental Deliveries of Coverage Data over 2 years
State data collection & conversion would last 2 years

Mapping of facilities would be frozen

GeoDB would be dismantled to append new deliveries:
  • Converted from M&M to ESRI Features
  • Unversioned
  • GeoMetric Network dropped
  • Relationships dropped

Need to load data & transition to production editing for backlog entry & map distribution for each delivery as soon as possible
Configuration Issue : APS - Conversion, Migration, & Configuration Time Line

Production ArcStorm Editing for METRO

Production GeoDB Editing for METRO

GeoDB & Application Configuration

Business & financial pressure to load & deliver state data for editing

Moving Targets :
- Core Software Versions for ESRI and Miner & Miner were under development
- Changing core functionality resulted in new business functionality requirements and GeoDB updates
- GeoDatabase Configuration
- Incremental State deliveries needed loaded
APS partnered with Laurel Hill to develop the GeoDatabase Comparison Tools

Tool Requirements
- Connect to two or more SDE geodatabases
- Easy to understand reports
- Portable report format
- It should be fast
- It had to be simple
Solution: Laurel Hill GIS - Development Details

Development Environment
- ArcObjects 8.3
- .NET C#

Testing Environment
- Two personal GeoDatabases were created
- Sample differences (configuration errors) were created in the "compare" GeoDatabase and documented

- 3 engines
  - Extraction - Extensible
  - Comparison - Fast
  - Reporting – Understandable
**Solution: Laurel Hill GIS - Development Details**

Over 60 exposed properties to be compared

4 Property Categories

Object and feature classes
- Feature datasets and Featureclasses
- Column information
- Spatial References
- Annotation properties

Domains
- Values and descriptions
- Subtypes
- Default values
- Default subtypes

Relationships
- Origin and destination tables
- Simple, composite or attributed
- Cardinality, notification and rules

Geometric networks
- Network name, participating feature classes
- Weights and associations
- Junction and edge connectivity rules
Solution: Laurel Hill GIS - DEMO
1. Evaluate NW & NE GeoDatabase to each other. Make appropriate corrections as identified:
   
   Pre-Results: pgnw_pgne\GDComparisonReport_b.htm
   Post-Results: pgnw_pgne\GDComparisonReport_c.htm

2. Error condition reported when testing new custom code drop against Development Instance. Ran comparison between Production & Development:

   Results: pmtr_pmtw\GDComparisonReport_0.htm

3. Evaluate Production to Designer Development Instance. Minor differences, no correction required at this time:

   Results: pmtr_pmtw\GDComparisonReport_minordiff.htm
Road Ahead: APS - GeoDatabase Merge

Metro & MetroWest

- Growth has encroached on boundary
- New subdivisions split on boundary
- Feeders with multiple boundary crossings

Plan to merge Metro with MetroWest needed to evaluate differences

Assessment:

pmtr_pmtw\GDComparisonReport.htm
The comparison tool is now GeoData Diagnostics

Two Versions
  • Enterprise (SDE and Personal Geodatabases)
  • Personal (Personal Geodatabases)

Uses for GeoData Diagnostics
  • Ensure development & production GeoDatabases match
  • Confirm GeoDatabase schema & properties for data acceptance
  • Certify GeoDatabase structure prior to Application development
  • Easily control configuration management for multiple GeoDatabases
Road Ahead : Laurel Hill GIS - GeoData Diagnostics

Ideas for future releases:

- Internal Integrity Testing
  - Orphaned Featureclasses and Tables
  - Unassigned domains

- Version Integrity
  - Check of A & D tables for orphaned edit records where parent version no longer exists
  - Report of "version state tree" delta & date delta between default & oldest version (may indicate need for reconciles)
  - Pre and Post Compress feature counts with base and A and D Tables

- GeoDatabase Reporting
  - GeoDatabase structure report
  - Report of subtype count per featureclass

Your ideas…
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Questions?